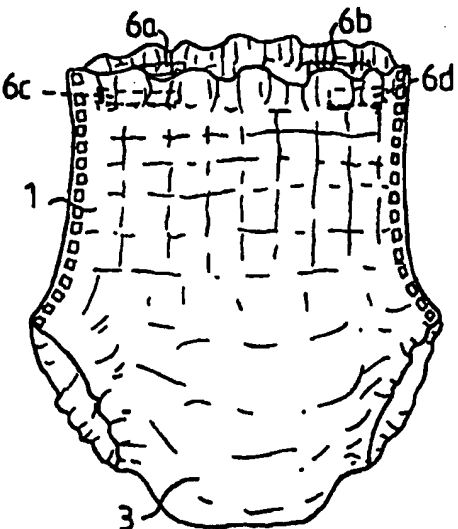


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(21) International Application Number: PCT/SE95/00169 (22) International Filing Date: 17 February 1995 (17.02.95) (30) Priority Data: 9400569-1 18 February 1994 (18.02.94) SE (71) Applicant (for all designated States except US): MÖLNLYCKE AB [SE/SE]; S-405 03 Göteborg (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): KLING, Robert [SE/SE]; Våvaregatan 13, S-511 63 Skene (SE). DREVIK, Solgun [SE/SE]; Hulebäcksvägen 16, S-435 35 Mölnlycke (SE). (74) Agents: PLATT, Timothy et al.; H. Albihs Patentbyrå AB, P.O. Box 3137, S-103 62 Stockholm (SE).		(81) Designated States: AU, CA, CZ, HU, JP, NZ, PL, SK, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: ABSORBENT PANT DIAPER (57) Abstract <p>In order to solve the problem of pant diapers (1) slipping down, without an excessive number of elastic threads or large and strong, and thus uncomfortable, elastic threads, at least portions of the surface of the waist portion facing the skin of the user have been provided with a hot-melt adhesive, for example to form a friction increasing surface (6a-d) against the skin, preferably sprayed on as points in a pattern, possibly only at the right and left hip portions of the waist portion.</p> 		

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ABSORBENT PANT DIAPER

The present invention relates to a pair of absorbent pants or a pant diaper for one-time use, comprising a crotch portion, front and back portions adjacent thereto, which are joined to form a waist portion surrounding the waist of the user, said portion being circumferentially elastic, an absorbent body, which is held tightly against the body of the user by the elastic waist portion. Such an absorbent pant diaper is known by our own Swedish patent application 9200663-4, having around the waist elastically extensible elements, for example elastically extensible strings, strips, film, fibre fabric, laminates or the like, which are designed to hold the pant diaper in place on the user and prevent it from slipping down from its intended position of use. In order to prevent the elastic tension from being uncomfortable for the user, the known pant diaper is provided with a large number of elastic elements, which, by virtue of their number, on one hand exert a sufficient total tightening force around the waist of the user for the pant diaper to not slip down, and, on the other hand, each does not exert an excessive local pressure on the user. However, the use of a large number of elastic elements involves a relatively high material cost. It is therefore desirable to be able to reduce the need for elastic elements in the waist portion of the pant diaper without having to deviate from the requirement that the pant diaper should stay up comfortably on the user.

These and other problems are solved by a disposable absorbent pant diaper of the type described by way of introduction which is characterized in that at least portions of the surface of the waist portion facing the skin of the user are provided with a friction agent to form a friction increasing surface against the skin. This

prevents the pant diaper from slipping down, in a very inexpensive and simple manner without having to use many elastic threads. This makes it possible to supply a very limited number of pant waist sizes while still requiring that the pant diaper should stay in place during use. The present invention can, however, also be used with advantage on a pant diaper having a large number of elastic elements in the waist portion. In this case, it is possible to reduce the tension which the elastic elements exerts on the user, since the frictional force of the friction agent compensates for the reduced friction resulting from the lowering of the elastic tension. It is of course possible to use the invention on other types of pant diapers as well, which do not use a large number of elastic elements in the waist, for the purpose of improving the friction against the body of the user, i.e. improving the stay-up capacity of the pant diaper.

US-A-4 834 739 describes the use of friction coatings on a sanitary napkin to keep the napkin in place relative to the underpants and thighs of the wearer. This invention is, however, directed to an entirely different problem as is mentioned above and an entirely different field, namely a sanitary napkin which is held up by the user's underpants.

The present invention will now be described in more detail with reference to the accompanying drawings, where:

Fig. 1 shows a schematic plan view of an absorbent pant diaper according to one embodiment of the invention as seen towards the outside of the pant diaper in a state in which the front and back portions of the pant diaper have still not been joined for forming the waist opening and the leg opening, and in which the elastic elements in the pant diaper are in their stretched-out state;

Fig. 2 shows a section along the line II-II in Fig. 1;
Fig. 3 shows a section along the line III-III in
Fig. 1;
Fig. 4 shows a view from the front of the pant diaper in
its assembled state;
Fig. 5 shows a pant diaper according to the invention
with the hot-melt material laid out in a spiral shape;
and
Fig. 6 shows the invention embodied in a pair of dis-
posable menstrual briefs.

Fig. 1 thus shows an absorbent pant diaper in its still
non-assembled state, i.e. the waist and leg openings of
the diaper have still not been formed. The pant diaper
comprises a front portion 1, intended to be applied to
the front of a user, a back portion 2, intended to be
applied to the rear of the user, and a crotch portion 3
between the front and rear portions 1, 2 intended to be
applied between the legs of the user. The front and back
portions 1 and 2 also each have two side edges 4, 5
intended to be attached together to form a pant diaper
according to Fig. 4. The pant diaper further comprises an
absorbent body 14 extending in the longitudinal direction
of the diaper and which is enclosed between an inner
cover layer 15 and an outer cover layer 16. The inner
cover layer 15 is applied on the wetting side of the
absorbent body 14 facing the user. It is liquid-permeable
and consists, for example, of fibre fabric, a so-called
non-woven. The outer cover layer 16 is liquid-impermeable
or at least hydrophobic and can, for example, consist of
a layer of polyethylene or a fibre fabric which has been
coated or laminated with polyolefines, for example, so
that it is made liquid-impermeable or at least hydro-
phobic. The absorbent body 14 can, for example, comprise
cellulose fibres as absorbent material. Furthermore, it
can comprise other absorbent materials such as polymer
hydrocolloid materials, for example in particle form.

Such materials are usually called super-absorbents defined as materials with a capacity to absorb liquid many times its own weight. A plurality of transverse elastic elements 17, for example elastic threads, tapes or the like, are applied in a pretensioned state across both the front and back portions 1, 2. The required number of such elastic threads is, however, less here than in previously known pant diapers with the same stay-up capacity.

In the front and back portions 1 and 2, respectively, layers 27 and 28, respectively, of textile-like material, for example fibre fabric, are arranged on the outermost layer of the pant diaper. The elastic threads 17 are applied between these layers 27, 28, and the outer cover layer 16 or the inner cover layer 15, respectively, within those portions of the front or back portion in which the outer cover layer 16 does not extend.

The rear layer 28, as as does the front layer 27, extends somewhat in over the rear or front edge of the absorbent body, thus also covering a portion of the outer cover layer 16. Along the front and back waist portions of the pant diaper, there extend two elastic elements 33, which can consist of elastic threads, tapes or the like applied pretensioned and which in this embodiment have a greater contractive force than the individual elastic elements 17 described above.

According to the invention, the surface 15 of the waist portion facing the user has portions 6a-d of a friction agent in order to increase the friction against the skin and thus prevent the pant diaper from slipping down.

The friction agent can be, for example, a flexible material of hot-melt type, i.e. a fusible glue, which provides a coating with a surface which is smooth and

non-porous. It must, however, not stick fast to the skin of the user, even at such high temperatures as 50°C. Flexible in this context means that the material is compliant and thus can follow and be stretched to the same extent as the material in the waist of the pant diaper when it is stretched as the user moves.

A suitable hot-melt material for use in this context is a material based on thermoplastic rubber, for example styrene isoprene rubber (SIS), styrene butadiene rubber (SBR), or styrene ethylene butadiene styrene rubber (SEBS). Other hot-melt materials can also be used, for example within the following groups: ethylene vinyl acetate copolymers, cellulose acetate butyrate, ethyl cellulose, and acrylic materials.

Other examples of friction agents are material of foam-type and water-based materials, for example polyvinyl acetate.

Portions 6a-d applied at the hip portions but not over the seams between the edge portions 4, 5 and not directly in the centre of the front and back portions have proved to be advantageous since the hands are placed there when pulling the pant diaper on and off. But the elastic hot-melt material can, of course, be applied in a strip or string extending around the entire inside of the waist portion, but this can, however, mean that certain portions of the hot-melt strip will stick to the stomach or backside when the pant diaper is pulled on or off. The hot-melt material can also be applied in the form of drops of glue or in spiral patterns which have been sprayed on various areas around the waist. One example of such an alternative application of hot-melt adhesive is shown in Fig. 5, where the material has been applied by a spray nozzle in a spiral form extending in a strip around the entire waist portion.

5 It is thus possible with the present invention to make the elastic threads 17 and/or 33 with less tension or fewer number and at the same time achieve the same stay-up capacity with better wearer comfort. In order to achieve the same wearer comfort without the present invention, it would have been necessary to provide pant
diapers with many different waist sizes, and this would make the product much more expensive and more difficult to use for the consumer.

Fig. 6 shows the invention embodied in a pair of menstrual briefs where correspondingly labeled strips of hot-melt friction increasing material 6a-d have been applied around the elasticized waist portion of a pair of menstrual briefs to achieve the same advantages as regards comfort and holding up capacity as are achieved in the pant diaper example discussed above.

The menstrual briefs are also provided with friction increasing hot-melt patches 19 along the leg openings facing the buttocks. They prevent the edges of the leg openings in the rear of the briefs from sliding across the buttocks and into the crease between the buttocks, causing discomfort and bunching of the absorbent material.

CLAIMS

1. Disposable absorbent pant or pant diaper, comprising a crotch portion (3), front and back portions (1, 2) adjacent thereto, which are joined to form a waist portion surrounding the waist of the user, said portion being circumferentially elastic, an absorbent body (14), which is held tightly against the body of the user by the elastic waist portion, characterized in that at least portions of the surface of the waist portion facing the skin of the user are provided with a friction agent to form a friction increasing surface against the skin.
2. Disposable absorbent pant or pant diaper according to Claim 1, characterized in that the friction agent is flexible and compliant with the elastic waist portion.
3. Disposable absorbent pant or pant diaper according to Claim 1 or 2, characterized in that the friction agent consists of a material of hot-melt type.
4. Disposable absorbent pant or pant diaper according to one of the preceding Claims, characterized in that the hot-melt material is based on a thermoplastic rubber.
5. Disposable absorbent pant or pant diaper according to one of Claims 1-2, characterized in that the friction agent consists of a water-based material.
6. Disposable absorbent pant or pant diaper according to one of Claims 1-2, characterized in that the friction agent consists of a material of foam-type.
7. Disposable absorbent pant or pant diaper according to one of the preceding Claims, characterized in that the

friction agent is arranged in portions extending in a row around the entire inside of the waist portion.

5 8. Disposable absorbent pant or pant diaper according to one of Claims 1-6, characterized in that the friction agent is arranged in portions which only extend along the right and left hip portion of the waist portion.

10 9. Disposable absorbent pant or pant diaper according to one of the preceding Claims, characterized in that the friction agent extends in a continuous strip along the waist portion.

15 10. Disposable absorbent pant or pant diaper according to one of Claims 1-8, characterized in that the friction agent is arranged in the form of points on the inside of the waist portion.

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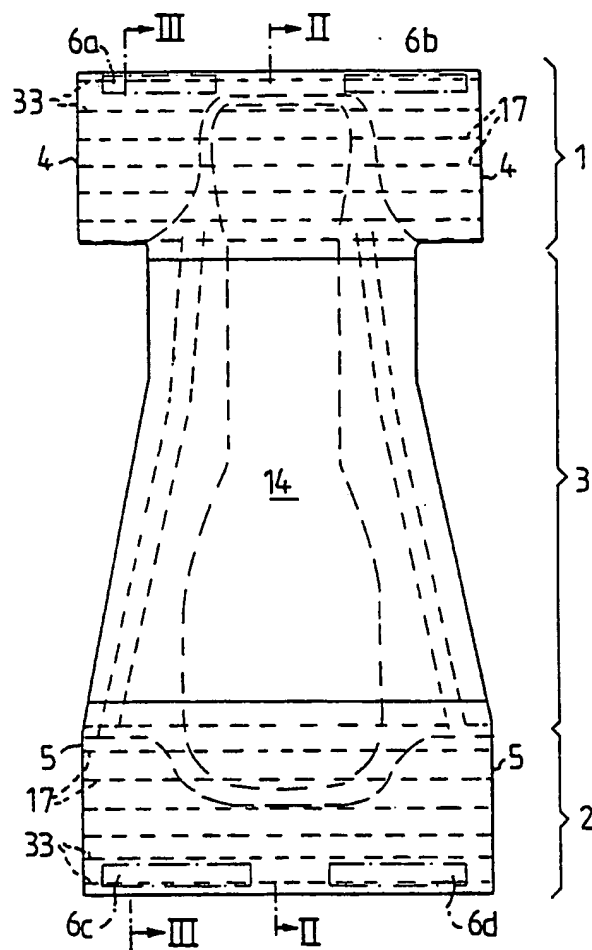


FIG. 1

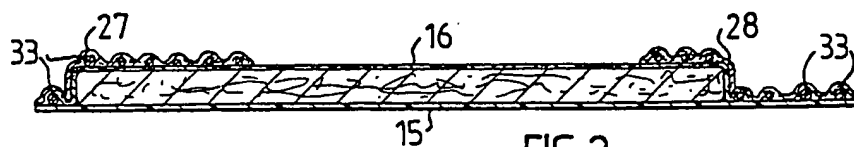


FIG. 2

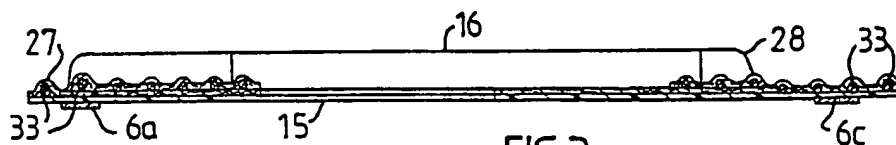


FIG. 3

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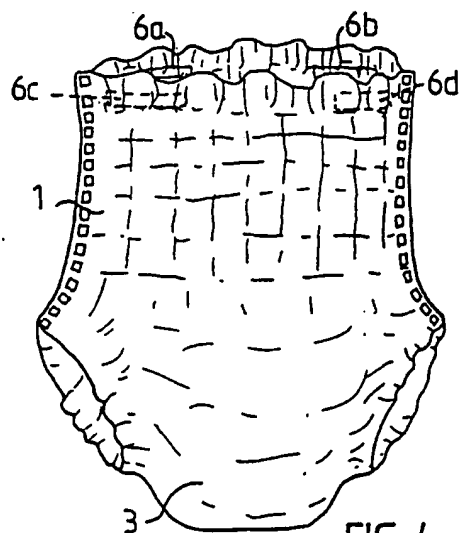


FIG. 4

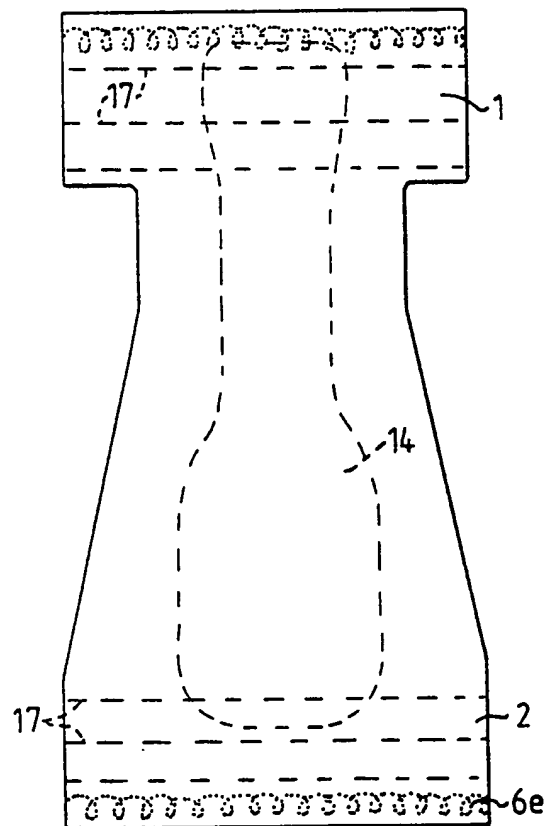


FIG. 5

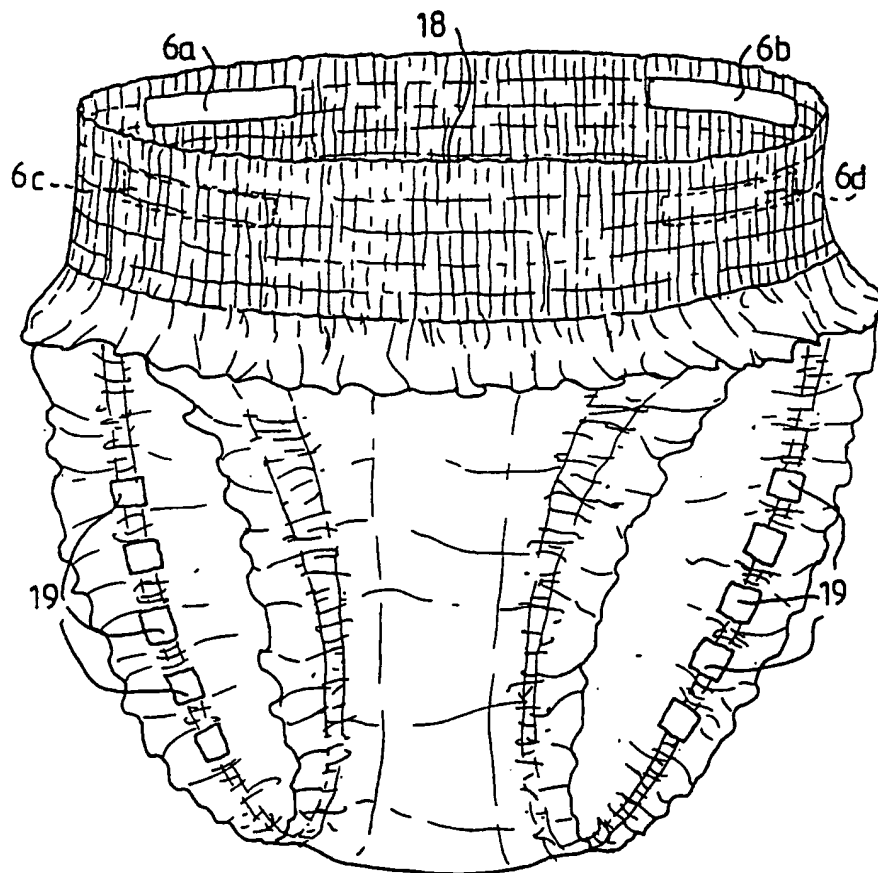


FIG.6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 95/00169

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61F 13/72 // A41B 9/14, A41B 13/04
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61F, A41B, A41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 3076201 (JACK A. WINTER), 5 February 1963 (05.02.63), column 1, line 9 - line 12; column 1, line 53 - line 56; column 2, line 11 - line 14	1,2,9
Y	---	3-8,10
Y	US, A, 1817991 (JOSEPH H. LANGROCK), 11 August 1931 (11.08.31), page 1, line 1 - line 5; page 2, line 20 - line 25 -----	3-8,10

☐ Further documents are listed in the continuation of Box C.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3076201	05/02/63	NONE	
US-A- 1817991	11/08/31	NONE	